PATENT
Attorney Docket No. VXM-001B

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S):	Vitaliano *et al.*		
SERIAL NO.:	10/661,466	GROUP NO.:	1631
FILING DATE:	September 11, 2003	EXAMINER:	Not yet assigned
TITLE:	Quantum Information Processing Elements and Quantum Information Processing Platforms Using Such Elements		

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

In accordance with the provisions of 37 C.F.R. 1.97 and 1.98, Applicants hereby make of record the patents and publications listed on the accompanying Form PTO-1449, and other information contained herein, for consideration by the Examiner in connection with the examination of the above-identified patent application. In accordance with the U.S. Patent Office's partial waiver of the requirement under 37 C.F.R. 1.98(a)(2)(i), only copies of the foreign patent documents and non-patent publications are enclosed.

REMARKS

In accordance with the provisions of 37 C.F.R. 1.97, this statement is being filed (CHECK ONE):

☒ (1) within three (3) months of the **filing date** of a national application other than a continued prosecution application under 37 C.F.R. 1.53(d), or within three (3) months of the **date of entry of the national stage** as set forth in 37 C.F.R. 1.491 in an international application, or before the mailing of the **first Office action** on the merits, or before the mailing of a **first Office action** after the filing of a request for continued examination under 37 C.F.R. 1.114; or

☐ (2) after the period defined in (1) but before the mailing date of a **final action** or a **notice of allowance** under 37 C.F.R. 1.311, and

☐ the requisite Statement is below, **OR**

☐ the requisite fee under 37 C.F.R. 1.17(p), namely **$180.00**, is included herein, or

☐ (3) after the mailing date of a **final action** or **notice of allowance** but before the payment of the **issue fee, AND**

☐ the requisite Statement is below, **AND**

☐ the requisite petition fee under 37 C.F.R. 1.17(p), namely **$180.00** is included herein.

It is respectfully requested that each of the patents and publications listed on the attached Form PTO-1449, and other information contained herein, be made of record in this application.

Respectfully submitted,

Date: July 19, 2004
Reg. No. 35,393

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CERTIFICATE OF FIRST CLASS MAILING UNDER 37 C.F.R. 1.8

I hereby certify that this correspondence, and any document(s) referred to as enclosed herein, is/are being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to the **Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450** on this **19th** day of **July, 2004.**

Monika A. Pychynska

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is/are:

Submitted are:

(1) Transmittal Form (1 pg.);

(2) Information Disclosure Statement (2 pgs.);

(3) PTO Form-1449 (6 pgs.);

(4) copies of references cited (C1-C95); and

(5) a return receipt postcard.

TRANSMITTAL FORM

Application Serial Number	10/661,466
Filing Date	September 11, 2003
First Named Inventor	Vitaliano
Group Art Unit	1631
Examiner Name	Not yet assigned
Attorney Docket No.	VXM-001B
BATCH NO. (after allowance)	Not applicable
Patent No.	Not applicable
Issue Date	Not applicable

ENCLOSURES *(check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Check Attached
  - ☐ Copy of Fee Transmittal Form
- ☐ Amendment/Response
  - ☐ Preliminary
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
  - ☐ Letter to Official Draftsperson including Drawings [Total Sheets _____]
- ☐ Petition for Extension of Time
- ☒ **Information Disclosure Statement**
  - ☒ **Form PTO-1449**
  - ☒ **Copies of IDS References (C1-C95)**
- ☐ Certified Copy of Priority Document(s)
- ☐ Sequence Listing submission
  - ☐ Paper Copy/CD
  - ☐ Computer Readable Copy
  - ☐ Statement verifying identity of above
- ☐ Copy of Notice to File Missing Parts of Application (PTO-1553)
- ☐ Formal Drawing(s)
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- ☐ Appeal Brief (in triplicate)
- ☐ Status Inquiry
- ☒ **Return Receipt Postcard**
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- ☐ Certificate of Facsimile Transmission under 37 C.F.R. 1.8
- ☐ Additional Enclosure(s) *(please identify below)*

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FORM PTO - 1449 INFORMATION DISCLOSURE STATEMENT	ATTORNEY DOCKET NO.: VXM-001B APPLICANT(S): Vitaliano et al. SERIAL NO.: 10/661,466 FILING DATE: September 11, 2003 GROUP: 1631

U.S. PATENT DOCUMENTS

EXAM. INIT.		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	A1	4,367,066	01/04/83	Zellweger, S.	434	433	
	A2	4,999,842	3/12/91	Huang et al.	372	45	
	A3	5,287,377	02/15/94	Fukuzawa et al.	372	45	
	A4	5,613,140	03/18/97	Taira, K.	395	800	
	A5	5,671,437	09/23/97	Taira, K.	395	800	
	A6	5,838,436	11/17/98	Hotaling et al.	356	345	
	A7	5,940,193	08/17/99	Hotaling et al.	359	11	
	A8	6,437,413 B1	08/20/02	Yamaguchi et al.	257	421	
	A9	6,456,994 B1	09/24/02	Tucci, R.	706	52	
	A10	6,459,097 B1	10/01/02	Zagoskin, A.	257	31	
	A11	6,472,681 B1	10/29/02	Kane, B.	257	14	

FOREIGN PATENT DOCUMENTS

EXAM. INIT.		DOCUMENT NUMBER	DATE	COUNTRY CODE	CLASS	SUB CLASS	FILING DATE	ABSTRACT ONLY	ENGLISH LANG (Y/N)

OTHER ART, JOURNAL ARTICLES, ETC.

EXAM. INIT.	OTHER DOCUMENTS: (Including Author, Title, Date, Relevant Pages, Place of Publication)	
	C1	Abe, E. (2001) "ESR on Shallow Donors in Ge," (PowerPoint Presentation)
	C2	Barenco et al. (1996) "A short introduction to quantum computation," www.qubit.org/library/intros/comp/comp.html.
	C3	Bayer, M. (August 8, 2002) "One at a time, please," *Nature* **418**: 597-598.

FORM PTO - 1449 INFORMATION DISCLOSURE STATEMENT	ATTORNEY DOCKET NO.: VXM-001B APPLICANT(S): Vitaliano et al. SERIAL NO.: 10/661,466 FILING DATE: September 11, 2003 GROUP: 1631

	C4	Benjamin et al. (date unknown) "Towards Quantum Information Technology," www.qubit.org/library/intros/nano/nano.html
	C5	Blatt, R. (2001) "Delicate information," *Nature* **412**: 773.
	C6	Borbat et al. (April 19, 2002) "Protein Structure Determination Using Long-Distance Constraints from Double-Quantum Coherence ESR: Study of T4 Lysozyme," *J. Am. Chem. Soc.* **124**: 5304-5314.
	C7	Brown J. (2000) "Minds, Machines and the Multiverse (The Quest for the Quantum Computer)," Chapter 1, Simon & Schuster 2000
	C8	Cheetham et al. (1996) "Inhibition of hsc70-catalysed clathrin uncoating by HSJ1 proteins," *Biochem J.* **319**: 103-108.
	C9	Claeysen et al. (November 18, 2002) "A Single Mutation in the 5-HT_4 Receptor (5-HT_4-R D100(3.32)A) Generates a G_S-coupled Receptor Activated Exclusively by Synthetic Ligands (RASSL)," *Journal of Biological Chemistry* **278**: 699-702
	C10	Claing et al. (2001) β-Arrestin-mediated ADP-ribosylation Factor 6 Activation and β_2-Adrenergic Receptor Endocytosis," *Journal of Biological Chemistry* **276**: 42509-42513
	C11	Coward et al. (1998) "Controlling signaling with a specifically designed G_i-coupled receptor," *Proc. Natl. Acad. Sci. USA* **95**: 352-357
	C12	Crotzer, V. L. et al. (2001) "The Role and Regulation of Clathrin in T cell Receptor Internalization," (Abstract) www.midwconfimmunol.org/Midwinter01/posters/crotzer.html
	C13	Deutsch et al. (1998) "Quantum Computation," www.qubit.org/library/intros/PhysicsWorld/PhysicsWorld.html, Page 1 only.
	C14	De Martini et al. (October 24, 2002) "Experimental realization of the quantum universal NOT gate," *Nature* **419**: 815-818
	C15	DiVincenzo, D. (1996) "Gates and Circuits: Sleator-Weinfurter construction: V^2=U," *Phil Trans. R. Soc. Lond. A*: 9-18.
	C16	DiVincenzo, D. (1997) "Quantum Gates and Circuits," *Phil Trans. R. Soc. Lond. A.*, Submitted
	C17	DiVincenzo, D. (1998) 'Real and realistic quantum computers," *Nature* **393**: 113-114.
	C18	Dowling et al. (date unknown) "Electron-Nuclear-Double-Resonance Quantum Computer"
	C19	Follstaedt et al. (2000) "Protein Adhesion on SAM Coated Semiconductor Wafers: Hydrophobic Versus Hydrophilic Surfaces," Sandia Report SAND_2000-3016
	C20	Gad, H. et al. (2000) "Fission and uncoating of synaptic clathrin-coated vesicles are per turbed by disruption of interactions with the SH3 domain of endophilin," *Nature* **27**:301-312 (Abstract only)
	C21	Gad, H. (2000) "Synaptic vesicle endocytosis studied in a living synapse," (Ph.D. Thesis) Karolinska Institute. (conclusions drawn from Ph.D. thesis)
	C22	Gershenfeld et al. (1998) "Quantum Computing with Molecules," *Scientific American*. June 1998 (www.media.mit.edu/physics/publications/papers/98.06.sciam/0698gershenfeld.html)

FORM PTO - 1449 INFORMATION DISCLOSURE STATEMENT	ATTORNEY DOCKET NO.: VXM-001B APPLICANT(S): Vitaliano et al. SERIAL NO.: 10/661,466 FILING DATE: September 11, 2003 GROUP: 1631

	C23	Gisin, N. (October 24, 2002) "NOT logic," *Nature* **419**: 797-798.
	C24	Greene at al. (2000) "Complete Reconstitution of Clathrin Basket Formation with Recombinant Protein Fragments: Adaptor Control of Clathrin Self-Assembly," *Traffic* **1**: 69-75.
	C25	Hameroff, S. (date unknown) "What is Consciousness," www.consciousness.arizona.edu/hameroff/slide%20show/slideshow_6.htm
	C26	Hameroff, S. (date unknown) "Quantum computation in brain microtubles? The Penrose-Hameroff "Orch OR" model of consciousness," www.consciousness.arizona.edu/hameroff/Pen-Ham/Orch_OR/Royal%20Society.htm
	C27	Hameroff et al (1998) "Quantum Theory and Human Consciousness," 47-62
	C28	Hardy et al. (2000) "Universal Manipulation of a Single Qubit," Centre for Quantum Computation, Clarendon Laboratory, Department of Physics, University of Oxford.
	C29	Harneit et al. (date unknown) "N@C_{60} for Quantum Computing," ...
	C30	Harneit et al. (July 20, 2002) "Architectures for a Spin Quantum Computer Based on Endohedral Fullerenes," *Phys. Stat. Sol.* **233**: 453-461.
	C31	Haucke V., "Molecular Mechanisms of Endocytosis," INABIS '98
	C32	Henderson et al. (date unknown) "CQC Introductions: Quantum Entanglement," www.qubit.org/library/intros/entang/index.html
	C33	Hubbell et al. (1998) "Recent advances in site-directed spin labeling of proteins," *Current Opinion in Structural Biology* 8: 649-656
	C34	Jaksch et al. (date unknown) "Review of quantum computer implementations with quantum optical systems," Institute for Theoretical Physics, Innsbruck (PowerPoint Presentation)
	C35	Kanaseki et al. (1969) "The Vesicle in a Basket: A Morphological Study of the Coated Vesicle Isolated from the Nerve Endings of the Guinea Pig Brain, with Special Reference to the Mechanism of Membrane Movements," *Journal of Cell Biology* **42**: 202-220.
	C36	Keen, description of Keen laboratory research
	C37	Kirchhausen, T. et al. (1997) "Linking cargo to vesicle formation: receptor tail interactions with coat proteins," *Current Opinion in Cell Biology* 9: 488-495
	C38	Koruga, D. (date unknown) "From Natural to Artificial Molecular Machines," (Abstract 6th Foresight from the Conference on Molecular Monotechnology) www.foresight.org/Conferences/MNT6/Abstracts/Koruga/
	C39	Laflamme et al. (August 22, 2002) "NMR GHZ" (www.arxiv.org)
	C40	Leuenberger et al. (2001) "Quantum computing in molecular magnets," Department of Physics and Astronomy, University of Basel, Switzerland.
	C41	Liu et al. (1995) "Regulation of Clathrin Assembly and Trimerization Defined Using Recombinant Triskelion Hubs," *Cell* **83**: 257-267

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	C42	Liu et al. (2001) "Observation of coherent optical information storage in an atomic medium using halted light pulses," *Nature* **409**: 490-493
	C43	Loss, D. (date unknown) "Spin-based Quantum Information Processing in Nanostructures," Department of Physics, University of Basel, Switerland - (PowerPoint Presentation)
	C44	Mekis, A. et al. (1995) "Ray chaos and Q-spoiling in Lasing Droplets," *Phys. Rev. Lett.* **75**: 2682-2686
	C45	Mullins, J. (2001) "The Topsy Turvey World of Quantum Computing," *IEEE Spectrum*: 42-49.
	C46	Myers, T. (date unknown) "From NANDS to Neurons: A Look at Alternative Approaches to Information Processing," www.cs.wayne.edu/~tom/csc888/csc888.html
	C47	Nöckel, J. U. et al. (1996) "Chaotic Light: A Theory of Asymmetric Resonant Cavities," Optical Processes in Microactivities, World Scientific Publishers, 1996
	C48	Nöckel, J. U. et al. (1994) "Q-spoiling and Directionality in Deformed Ring Cavities," *Optics Letters* **19**: 1693-1695
	C49	Oskin et al. (January 2002) "A Practical Architecture for Reliable Quantum Computers," *Computer*: 79-87.
	C50	Owen, D.J. (2000) "The structure and function of the ß2-adaptin appendage domain," EMBO Journal 19: 4216-4227
	C51	Pan et al. (date unknown) "A Precision Technology for Controlling Protein Adsorption and Cell Adhesion in Biomems," (manuscript)
	C52	Preskill, J. (1997) "Reliable Quantum Computers," (manuscript) California Institute of Technology. (www.arxiv.org)
	C53	Redfern, C. (1999) "Conditional expression and signaling of a specifically designed G_i-coupled receptor in transgenic mice," *Nature Biotechnology* **17**: 165-169
	C54	Recher et al. (2000) "Quantum Dot as Spin Filter and Spin Memory," *Physical Review Letters*: **85** 1962-1965.
	C55	Rieffel et al. (2000) "An Introduction to Quantum Computing for Non-Physicists," *ACM Computing Surveys* **32**: 300-335.
	C56	Scearce-Levie et al. (2001) "Engineering receptors activated solely by synthetic ligands (RASSLs)," *Trends in Pharmacological Sciences* **22**: 414-420
	C57	Shih, W. et al. (1995) "A Clathrin-binding Site in the Hinge of the ß2 Chain of Mammalian AP-2 Complexes, *The Journal of Biological Chemistry* **270**: 31083-31090.
	C58	Smith, T. (date unknown) "Why do I like Clifford Algebras?," www. innerx.net/personal/tsmith/clfpg.html
	C59	Smith, T. (date unknown) "Quantum Consciousness," www. innerx.net/personal/tsmith/QuanCon.html
	C60	Steane, A. (1996) "Quantum Error Correction," www.qubit.org/library/intros/QEC.html

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	C61	Steane, A. (1997) "Quantum Computing," Department of Atomic and Laser Physics, University of Oxford, Clarendon Laboratory: 1-65.
	C62	Steane, A. (1998) "Quantum Computing," *Reports on Progress in Physics* **61**: 117-173
	C63	Steane et al. (2000) "Physicists Triumph at Guess My Number," *Physics Today*, 35-39
	C64	Takei et al. (1998) "Generation of Coated Intermediates of Clathrin-Mediated Endocytosis on Protein-Free Liposomes," *Cell* **94**: 131-141
	C65	Twamley, J. (October 30, 2002) "Quantum cellular automata quantum computing with endohedral fullerenes," (manuscript) (www.arvix.org)
	C66	Van Koppen, C. J. (date unknown) "Multiple pathways for the dynamin-regulated internalization of muscarinic acetylcholine receptors" (Abstract)
	C67	Vitaliano, F. (2001) "The Next Big Thing That Will Change Absolutely Everything," www.vxm.com/Speed.quantum.html
	C68	Vitaliano, F. (June 18, 2002) "VXMaia: A New Quantum Computing System," (PowerPoint Presentation)
	C69	Vitaliano, F. (October 23, 2002) "VXMaia: A New Quantum Computing System for Biotech," (PowerPoint Presentation)
	C70	Vitaliano, F. (February 2003) "VXMaia: A New Quantum Computing Platform" (PowerPoint Presentation)
	C71	Vitaliano, F. (September 2003) "EXQOR: A New NBIC Platform" (PowerPoint Presentation)
	C72	Vitaliano, F. (February 2004) "ExQor: A New NBIC Platform"
	C73	Vitaliano et al. (January 29, 2004) "Clathrin and Endocytosis" (PowerPoint Presentation)
	C74	Volovich I.V. (1999) "Atomic Quantum Computer," (manuscript) (www.arxiv.org)
	C75	Vrijen et al. (1999) "Electron Spin Resonance Transistors for Quantum Computing in Silicon-Germanium Hetero-structures," (manuscript) (www.orxiv.org)
	C76	Ybe et al. (1998) "Clathrin self-assembly is regulated by three light-chain residues controlling the formation of critical salt bridges," *The EMBO Journal* **17**: 1297-1303.
	C77	Ybe et al. (1999) "Clathrin Structure Reveals Motifs for Self Assembly," www.als.lbl.gov/als/science/sci_archive/clathrin.html
	C78	Ybe et al. (date unknown) "Crystal structure of a repeating superhelix motif in the clathrin triskelion leg,"
	C79	Ybe et al. (2000) "Molecular Structures of Proteins Involved in Vesicle Fusion," *Traffic* 1: 474-479.
	C80	"Adaptin ß", (date unknown) Catalog number A35620. Transduction Laboratories, 133 Venture Court, Lexington, KY 40511-2624
	C81	"Basic EPR Theory" (date unknown)

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	C82	Centre for Quantum Computation, www.qubit.org (date unknown)
	C83	"Continuous Wave ENDOR," (date unknown)
	C84	"Electron Spin Resonance (ESR)," (2000) Physics 77, Experiment 6
	C85	"EPR Continuous Wave Practice Page," www.bruker-biospin.com/brukerepr/continuouswavepractice.html (date unknown)
	C86	"Genecard for gene CLTCL1," www.rzpd.de/cgi-bin/cards/carddisp?CLTCL1 (date unknown)
	C87	"Introduction to Mass Spectrometry," masspec.scripps.edu/information/intro/chapter3.html (date unknown)
	C88	"pET-15b Vector," (1998), Novagen Catalog
	C89	"pET-23a-d(+) Vectors," (1998), Novagen Catalog
	C90	"QIAexpress - The Complete System," Qiagen Catalog www.qiagen.com/catalog/auto/cget.asp?p=QIAexpress_complete_system (date unknown)
	C91	"Quantum Entanglement: Recent Developments in Teleportation/Entanglement," www.cakes.mcmail.com/StarTrek/teleportation.htm (date unknown)
	C92	"Receptor Mediated Endocytosis," www.erin.utoronto.ca/~w3bio315/RME.htm (date unknown)
	C93	"Simple quantum gates," www.qubit.org/library/intros/comp/inset2.html (date unknown)
	C94	"Universal gates," http://planck.thphys.may.ie/jtwamley/thesis/Hovland/thesis/node17.shtml (date unknown)
	C95	Harneit, W. (2001) "A fullerene-based electron spin quantum computer," (manuscript)

EXAMINER	DATE CONSIDERED